

CLAIMS

1. Device to monitor the penetration of an instrument (1) in an anatomic structure, in particular a bone structure, comprising a source of current supplying at least two electrodes and a means to measure the impedance between the aforementioned electrodes, the aforementioned electrodes (2, 3) are located on the aforementioned penetration instrument (1) characterised in that the device comprises at least a first electrode presenting a contact surface coinciding with the distal surface of the aforementioned penetration instrument and at least a second electrode presenting a contact surface coinciding with the lateral surface of the aforementioned penetration instrument (1), said contact surfaces dimension are so as to present a coinciding and constant contact surface as a function of the degree of penetration of the aforementioned penetration instrument (1) in the aforementioned bone structure.

2. Device according to claim 1, characterised in that it comprises two electrodes coinciding with the distal surface of the aforementioned penetration instrument (1), the aforementioned electrodes being coaxially arranged and separated from each other by an insulation (4).

3. Device according to claim 1, characterised in that it comprises two electrodes coinciding with the distal surface of the aforementioned penetration instrument (1), the aforementioned electrodes being symmetrical with respect to the longitudinal axis of the aforementioned penetration instrument.

4. Device according to any of the previous claims, characterised in that the aforementioned electrode at least presents one annular contact surface.

5. Device according to claim 1, characterised in that it comprises one main electrode coinciding with the distal surface of the aforementioned penetration instrument (1) as well as a plurality of laterally coinciding secondary electrodes to form longitudinally spaced annular contacts.

6. Device according to claim 1, characterised in that it comprises a first electrode coinciding with the distal surface of the aforementioned penetration instrument (1), a second electrode coinciding with the lateral surface of the aforementioned penetration instrument (1) and a third electrode partially covering lateral surface of the aforementioned penetration instrument (1).

7. Device according to any of the previous claims, characterised in that it also comprises means of signalling producing a signal during the detection by the aforementioned means to measure the impedance by a variation in impedance.

8. Device according to the previous claim, characterised in that the signal produced is a sound signal whose frequency and/or rhythm decrease as a function of the impedance measured.

9. Device according to the previous claim, characterised in that the frequency and/or rhythm decrease in a non linear manner as a function of the impedance measured.

10. Device according to any of claims 7 to 9, characterised in that the signal produced when the aforementioned instrument leaves the bone structure is an acute sound signal with a rapid rhythm.

11. Device according to any of claims 7 to 9, characterised in that the signal produced when the aforementioned instrument penetrates the bone structure is a low-pitched sound signal with a slow rhythm.

12. Device according to any of the previous claims, characterised in that the aforementioned device is an autonomous device.

13. Device according to any of the previous claims, characterised in that it comprises a central channel for the passage of an additional instrument.